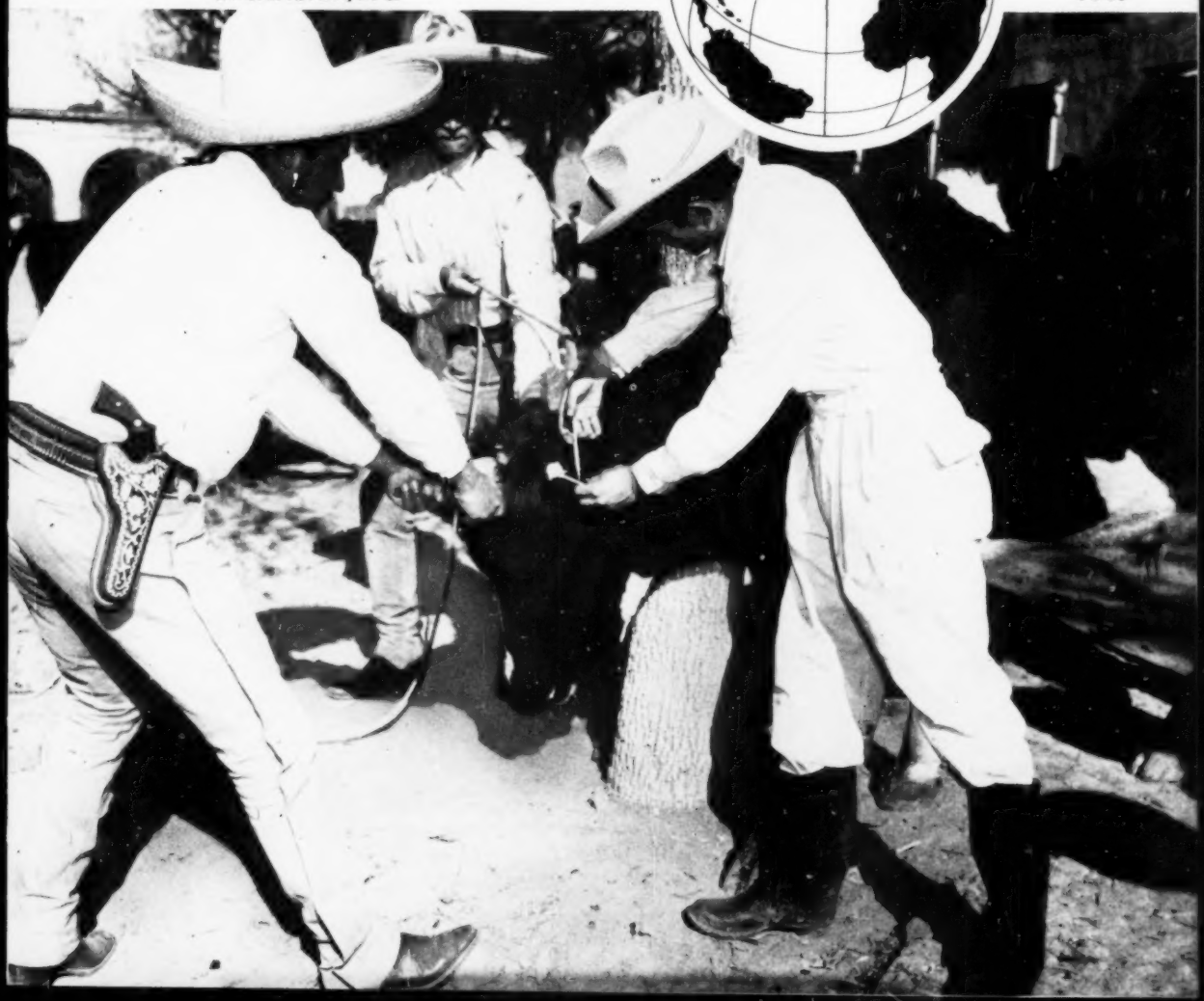
Foreign Agriculture

ISSUED BY
OFFICE OF FOREIGN AGRICULTURAL RELATIONS, U. S. D. A.
WASHINGTON, D. C.

JULY
1949



Foreign Agriculture

Vol. XIII • JULY 1949 • *No. 7*

IN THIS ISSUE

PAGE

Foot-and-Mouth Disease Control in Mexico—Third Year 147
An Egyptian Modernizes a Roman Irrigation System 152
World Food Production and Consumption Outlook 154
Sugarcane in Central America 157
Cooperative Customers Abroad 160
Okinawa's Agriculture in the Wake of War 163
International Agricultural News 167

FRONT COVER

Vaccinating a Steer Against Foot-and-Mouth Disease

This scene is reenacted more than 100,000 times each day in Mexico.

BACK COVER

Map Showing Quarantine Area and Vaccination-Operation Areas in Mexico

Some 15 million animals must be vaccinated at least four times a month until the foot-and-mouth disease cycle is broken.

Credit for photos is given as follows: Signal Corps, p. 164; Kenneth Olson, pp. 165, 166.

NEWS NOTES

FAO Council Meets in Paris

The Sixth Session of the Council of the Food and Agriculture Organization of the United Nations met in Paris for 2 weeks beginning June 13. Albert W. Loveland, Under Secretary of Agriculture, attended as the member from the United States, and Edward Cale, Department of State, was his assistant.

Among the issues listed on the agenda were the permanent site of the FAO headquarters, a report from the Commodities Study Committee regarding additional world trade agreements similar to the Wheat Agreement signed the first of this year, and further consideration of the scale of contributions of member nations.

In addition to Mr. Loveland and his assistant, Mr. Cale, five advisors attended the Session from the United States. They were: William W. Chandler, Assistant to the Under Secretary of Agriculture; Robert B. Schwenger, OFAR; Lionel C. Holm, Production and Marketing Administration; Mrs. Ursula Duffus, Department of State; and James O. Howard, OFAR.

Mr. Horn Attends Caribbean Meeting

Claud Horn, Head, Complementary Crops Division, Technical Collaboration Branch, OFAR, attended the Second Annual Meeting of the Research Council of the Caribbean Commission May 27–30 in Port-of-Spain, Trinidad. Member nations concerned with the welfare of the Caribbean islands—the United Kingdom, France, the Netherlands, and the United States—sent representatives to the meeting.

Marketing Specialist Goes to Europe

J. Bernard Gibbs, Head, Tobacco and Tropical Products Division, International Commodities Branch, OFAR, sailed June 1 for Europe aboard the S. S. *America* to begin a 3-month study of tobacco markets in 10 European countries. His trip is in connection with a continuing study, begun in January 1948, to survey foreign markets for and competition with United States tobacco. He will confer with representatives of the United States and European governments and of the international tobacco trade. Mr. Gibbs began his survey in Paris and, in addition to France, plans to visit Ireland, the United Kingdom, Belgium, the Netherlands, Spain, Germany, Denmark, and Sweden.

FOREIGN AGRICULTURE — ALICE I. FRAY, EDITOR

A monthly publication of the Office of Foreign Agricultural Relations of the United States Department of Agriculture, Washington, D. C. The matter contained herein is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication has been approved by the Director of the Bureau of the Budget (November 6, 1947). Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 15 cents per copy, or by subscription at the rate of $1.50 per year, domestic; $2.00 per year, foreign. Postage stamps will not be accepted in payment.

Foot-and-Mouth Disease Control In Mexico—Third Year

The Joint Foot-and-Mouth Disease Commission program in Mexico is aimed at saving the Mexican livestock economy and at safeguarding U. S. livestock from a disease that might well cost $200 million a year.

by J. K. McCLARREN

One of the largest scale attacks ever waged against an animal disease is now well into its third year in Mexico, where Mexican-United States authorities have joined ranks to eradicate the most insidious of all livestock maladies—the dread foot-and-mouth disease that affects cloven-footed animals (cattle, swine, sheep, and goats).

The United States has a vital protective interest in eradicating the disease in Mexico. If foot-and-mouth disease, known in Mexico as *aftosa* fever, became established in the extensive livestock industry of this country, its toll in losses to United States farmers would be tabulated in hundreds of millions of dollars annually. While actual death losses probably would not exceed 3 to 5 percent, the debilitating effects of the disease in terms of losses in meat, milk, and other animal products would strike a heavy blow against our high living standards.

The final outcome of the Mexican program still hangs in the balance. On the positive side the fur-

Vaccinating sheep against foot-and-mouth disease in Mexico.

ther spread of the disease has been definitely halted and confined within quarantine lines. A program of control and eradication through slaughter of actively infected animals and vaccination of susceptible species, followed by periodic post-vaccination inspection, is now in full swing. A follow-up second vaccination, designed to extend the period of immunity, is well under way. Vaccine production has now reached a level sufficient to meet all needs. It is no longer necessary to depend on foreign supplies.

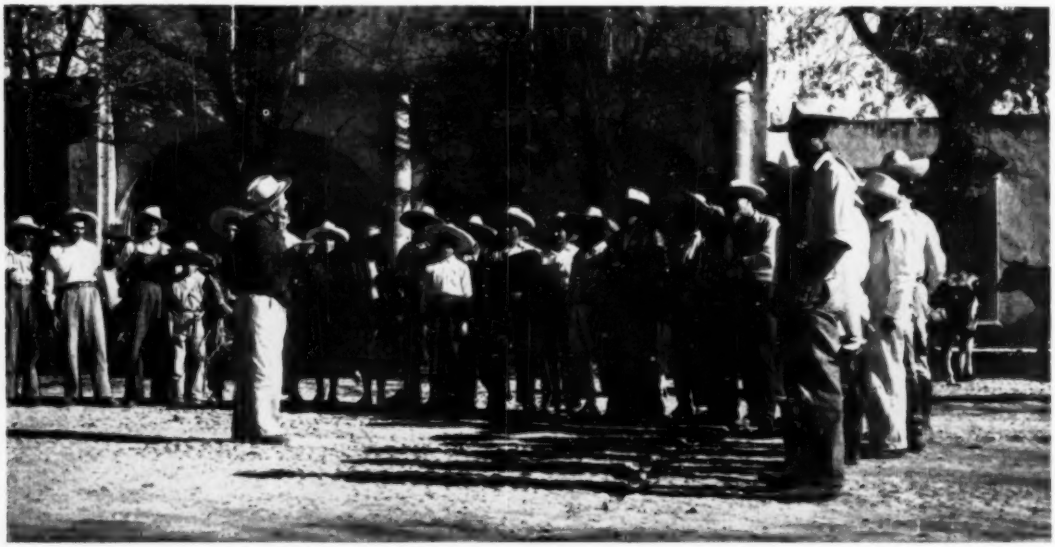
Longer-Duration Vaccine Sought

Many questions remain to be answered. The biggest one relates to the vaccine itself. When the vaccination program was begun, it was hoped that the second round of vaccination could be held off for at least 6 months. Reports from Europe, where foot-and-mouth vaccines were developed, indicated immunity up to 6 months. Duration of immunity tests conducted with the vaccine produced in Mexico shows that the period between the first and second vaccination cannot be extended safely beyond 4 months. As a result of these findings the vaccination schedule has been changed from the planned two-a-year to at least three-a-year for all susceptible species in the quarantine area. Other questions that must await further investigation are: How many times will it be necessary to vaccinate before the infection is totally wiped out? Can a vaccine be developed that will give longer immunity than that now in use? How long will the program take? The answer to the last question hinges upon the answers to all the others and no estimate of time can now be given.

Officials of both Governments are convinced, however, that we cannot await answers to all questions before going all out on the control and eradication program. Since December 1946, when the disease was discovered and identified, effort has been directed toward its complete eradication. Unfortunately, the disease had raged through much of central Mexico before effective steps could be taken to halt its further spread. Quarantine lines were established well above all areas of infection to the north and below the diseased area to the south. Movement of susceptible animals across quarantine lines was prohibited, and strict sanitary measures were applied to prevent spread by other means.

Joint Commission Administers Program

A Mexican-United States Commission for the Eradication of Foot-and-Mouth Disease was established and immediate steps were taken to wipe out the malady through slaughter of all diseased and exposed animals, followed by quarantine and cleaning and disinfection of premises where the disease existed. In about 10 months, more than 900,000 animals were slaughtered. By November 1947, it was obvious that the disease had become so thoroughly



An *informadore* explains the Commission's work to a group of Mexican farmers in advance of inspection and vaccination brigades.

established within the quarantine zone, an area roughly the size of Texas, that the strict slaughter program would seriously disrupt the economy of Mexico. Livestock production is one of the principal industries of the area, and many millions of rural people depend on their livestock for day-to-day existence. The slaughter program was taking their meat and milk, hides and wool, as well as their oxen, which provide the power for plowing.

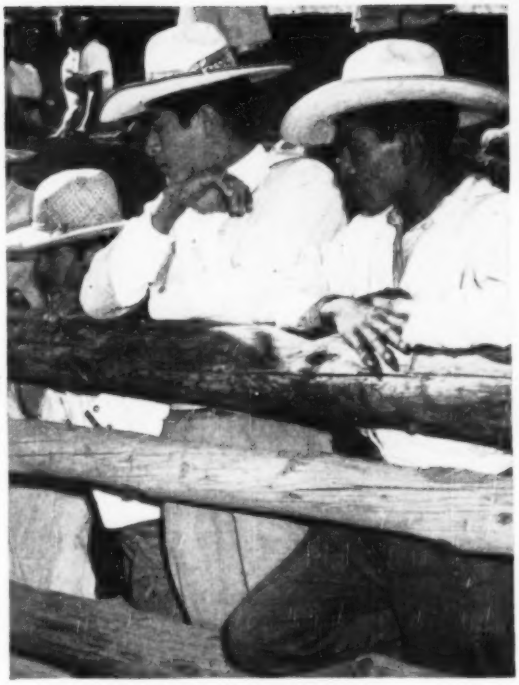
In November 1947, therefore, at the request of the Mexican Government, the Commission decided to modify the slaughter program. The five points involved in this program included the four previously stressed in the campaign—inspection, quarantine, slaughter of diseased animals, and disinfection of premises where the disease occurred—and a fifth, vaccination. The cooperating Governments realized that such a modified program would extend the time needed to eradicate the disease, and in the long run would prove more costly in terms of money spent. The step, however, became mandatory because of rising opposition to the strict slaughter program and because of the strain placed on the economy.

The Joint Commission has made good progress in the comparatively short time since emphasis has been shifted to vaccination along with the original four-point program. Despite technical problems met and overcome in vaccine production and regardless of extreme physical difficulties—mountains in the north and west and almost impenetrable jungles of the eastern coastal plains—efficiency of inspection and vaccination brigades has reached a high peak. Some 15 million animals in the quarantined area are expected to be vaccinated for the first time by about midyear, with about half this number vaccinated the second time. The third round of vaccination is expected to begin soon afterward.

Teamwork Stressed in Organization

How this gigantic program is carried on is best described by an explanation of the teamwork and organization of the Commission staff. The Commission itself is composed of high-ranking officials of the Departments of Agriculture of the two countries. The Bureau of Animal Industry, which has successfully eradicated the disease from the United States nine times, represents the United States Department of Agriculture. Lic. Oscar Flores, Under Secretary of Agriculture for Livestock in Mexico, is Director of the Commission. General Harry H. Johnson, special assistant to Secretary Brannan of the United States Department of Agriculture, is Co-Director.

Mr. McClarren is Head, Information Division, Bureau of Animal Industry, ARA.



Mexican livestock owners.

Mexicans Do the Vaccinating

Plans and action programs for the Commission's operating divisions are under the supervision of trained technical directors. Mexican-United States counterparts serve together in carrying out the program, the only exception being the vaccinators. Only Mexican personnel are used in this capacity.

The principal operating divisions include Vaccine Production, Inspection and Vaccination, Quarantine, and Engineering. In addition there are an Information Division which, because of the nature of the program, plays a vital role, and several administrative or housekeeping Divisions.

The Vaccine Production Division's primary job is to produce vaccine and to conduct immunity and innocuity tests with the vaccine and any other investigational services in connection with the production, testing, storing, and shipping of vaccine.

Inspectors of the Inspection and Vaccination Division are on constant watch for outbreaks of the disease within the quarantine area. They plan and

execute slaughter programs where necessary and determine when areas where infection has existed are safe for restocking. The activities of the vaccination program are carried out by this Division.

Maintenance and patrol of the two main quarantine lines, as well as setting up quarantines about infection pockets to prevent spread of the disease both within and without the main quarantine zone, are duties of the Quarantine Division. Brigades of this Division also disinfect diseased premises and equipment and guard against infection passing over the main quarantine line. Appraisers place the values on destroyed animals and purchase animals used for vaccine production.

Transportation, communication, and construction are the three big jobs of the Engineering Division. The task of reaching remote mountain fastnesses and tropical jungles with properly refrigerated vaccine has often taxed the ingenuity of the Commission's engineers. Nevertheless, vaccinating brigades are seldom delayed, and the program is progressing at about the high level set by the Commission.

An important role in the program—that of protecting Commission personnel and the enforcement of Commission regulations—is in the hands of the Mexican Army. All inspection, vaccination, and quarantine brigades are accompanied by armed squadrons. Army guards patrol the main quarantine lines and guard the main inspection stations.

Area Divided into Nine Regions

For efficient operation the quarantine area has been divided into nine operating regions (see map on back cover). The program in each of these regions is under the codirection of counterpart Mexican-United States veterinarians who coordinate the activities of the various operating divisions in the field. Day-to-day field activities are planned and directed from district headquarters or subheadquarters.

Information men, or *informadores*, work ahead of the inspection and vaccination brigades to acquaint the people with the purpose of the *aftosa* campaign. Insofar as possible the *informadores* obtain an informal count of the susceptible livestock and make arrangements for the inspection brigades that follow. In rural Mexico there are many areas where Indian languages still persist. The 1940 census showed a list of 34 principal Indian languages spoken exclusively in small isolated communities, many so inaccessible that they can be reached only by muleback. Practically all these people are illiterate and can be influenced only by the spoken word, each in his own particular Indian dialect. In some areas, Spanish is almost as foreign a language as English.

The language barrier and primitive cultures have been the root of much of the opposition to the program. The Commission is using every possible means to keep the people informed, but the job is difficult because they cannot be reached by any mass medium. Thus the use of *informadores* has been the most effective means of education.

Animals Slaughtered in Centers Of Active Infection

Following the *informadores* come the inspectors, who examine susceptible animals for evidence of foot-and-mouth disease. Where active cases of the disease are found, quarantine brigades are called in and the premises quarantined. All animals actively infected with the disease, and those exposed animals not previously protected by vaccination, are slaughtered and buried. Immediate cleaning and disinfection is undertaken. The owner is paid the going market price for all animals slaughtered; the rate of payment is set by appraisers representing both the Mexican and the United States Governments.

If, on inspection, no evidence of disease is found, arrangements are completed for the entrance of the vaccination brigades, which follow closely behind the inspectors. Generally, arrangements are made for the owners to bring their stock to a central place, such as a village or watering hole. Where the owners are cooperating (and less and less opposition is being encountered) they generally assist by roping and tying the animals to be vaccinated. Thus, a three-man crew, consisting of one man shaving a patch of hair from the neck, another injecting the vaccine, and a third ear-tagging the vaccinated animals, can vaccinate 300 to 600 animals a day, depending on the concentration of livestock.

Post-vaccination inspectors make at least 30-day checks behind the vaccinators to see that the vaccine has taken effect. These crews are accompanied by a vaccinator who vaccinates any animals missed and also any newly born animals.

Behind the "battle of the needle" goes on one of the most intricate systems of supply and intelligence ever planned for a peacetime operation.

After solving technical problems of vaccine production, the Commission was faced with producing vaccine on a scale of about 100,000 doses per day if vaccination schedules were to be maintained. In all of May 1948 the Commission laboratories produced 36,000 doses. But in 6 months time supply has

Officials of the Mexican-United States Commission for the Eradication of Foot-and-Mouth Disease. Left to right: Dr. Robert J. Anderson and Dr. L. R. Noyes, of the U. S.; Lic. Oscar Flores, of Mexico; Gen. H. H. Johnson, of the U. S.; and Federico Rubio Lozano, of Mexico.

caught up with demand and in the first quarter of 1949 a steady average of 100,000 doses per day has been maintained.

Transportation a Big Problem

Vaccine must be produced from the live virus that causes the disease. Healthy cattle must be infected with the virus to obtain the large quantity of virus required. This means importing large numbers of cattle from the "clean" area north of the quarantine line for this purpose. At the present time about 2,400 cattle per week are brought to vaccine-production units. These cattle are purchased by the Quarantine Division and delivered to holding points at Aguascalientes and Ciudad Victoria, both north of the quarantine line. The transportation section of the Engineering Division then delivers the cattle to Mexico City.

Seventeen round trips a day are made with large trailer units to haul the cattle. The Commission has 40 of these trailers operated by 172 drivers on a strict time schedule. The routes cover about 600 miles of the roughest mountain roads on the Pan American Highway. One hour after arriving at either Aguascalientes or Ciudad Victoria the trucks are loaded and sealed for the return trip, which requires about 17 hours. Drivers make two stops where they report to their headquarters by short-wave radio.

The cattle are delivered to Santa Ana, just north of Mexico City, where "clean" pens are maintained inside the quarantine area. After unloading, the truck-trailers are driven into the main transportation center at San Jacinto, where each unit is thoroughly washed and disinfected and each motor checked before making another round trip. By means of a tacograph installed on each truck, officials can check all stops and time wasted on each trip. The drivers, however, take great pride in maintaining the strict schedules, and only one serious mishap has occurred since the big haul started.

Vaccine Must Be Properly Refrigerated

From the clean holding units at Santa Ana, where the cattle are held under observation for other diseases that might complicate vaccine production, they are then dispatched to virus production and testing units located at San Cristobal, Ixtapalapa, and Tacuba, all within a short distance of Mexico City. Animals in the virus-production units are injected with *aftosa* virus and slaughtered 24 hours afterwards. Tongues of the infected animals are harvested for virus and sent to the vaccine-production laboratories, where the virus is made into vaccine. As soon as the vaccine is produced, it is subjected to potency and innocuity tests for which unexposed healthy cattle from northern Mexico are used as test animals. When the vaccine is pronounced safe and effective it is sent to the field.

Each district and subdistrict headquarters has large portable refrigerators for storing vaccine for field use. Each of the units can be powered by portable generators as electricity often is not available. Vaccination brigades draw upon these supplies, carrying portable boxes in which the vaccine is kept iced

Where brigades must enter remote areas by mule-pack train, a constant supply of ice must be brought to them daily, either by pack train or dropped to them from the air. The vaccine must be kept at temperatures ranging from 34° to 39° F.

Telecommunication Helps Keep Program Going

The Commission also is rapidly solving the problem of extended communication lines, as the keeping of more than 4,000 workers in the right spot at the right time at first was one of the most difficult tasks. This problem is being solved by the establishment of a radio network, which now reaches the most remote outposts. "San Jacinto" is perhaps the most familiar name to radio operators throughout Mexico, as this is the call name for the central station operating from Engineering headquarters.

The station now operates on six frequencies, and the Mexican Government recently allotted eight more frequencies to the Commission. All districts and subdistricts are now equipped with powerful transmitting and receiving sets, similar equipment being installed at substations for field brigades. The use of portable equipment for brigades in the field has been found to be successful, and it is planned to supply field crews with "walkie-talkies" in the near future.

Over this modern telecommunications system come daily reports of progress from each of the nine districts and instructions from headquarters to field points. Such problems as shortages of equipment, personnel, and supplies can be taken up immediately. The system also serves dispatchers for the vast transportation system and makes possible emergency transport on short notice.

Morale Praised by Commission Directors

General Johnson and Lic. Flores recently praised the high morale of the Commission workers and expressed satisfaction with the rising efficiency of the all-out program to eradicate the disease. The following statistics reflect the current field work of the Commission:

	Vaccine produced	*Animals vaccinated*	*Animals slaughtered*
	Doses		
January	2,500,000	1,775,186	3,557
February	2,000,000	1,738,360	2,205
March	2,300,000	2,404,970	719

The Commission recently has recruited more lay inspectors to assist in the inspection and vaccination programs. With the second vaccination now well under way and added territory under supervision, more post-vaccination inspectors are needed to see that no outbreaks go unobserved. As long as the disease exists in Mexico, there is a definite threat to the vast livestock industry of the United States. United States livestock men are keeping in constant touch with the progress of the Mexican program and, with Mexican stockmen, hope for success.

An Egyptian Modernizes A Roman Irrigation System

By **E. R. RAYMOND**

The same water-saving principle used by the Romans to irrigate the desert 1,850 years ago, when they occupied Egypt, is being used today by Moise Pontremoli on his desert farm 40 miles west of Alexandria and 3 miles from the Mediterranean Sea.

The Romans cut huge underground cisterns out of the solid stone formations found lying below depressions in the land surface. The precious rainwater that fell on the land surrounding these depressions during about 4 months of the year would drain into these cisterns. Here it was stored, and, when needed, lifted from the cisterns in goatskins, and carried to the crops of grain, vegetables, and fruit that were grown the year around. Sometimes the Romans built canals from the cisterns to the fields and poured the water into the canals. This irrigation system made it possible for humans and animals to live on land that otherwise was practically barren and desolate. Some of the largest of these cisterns had a capacity o 20,000 tons of water. Many are still intact, and two of them are being used today by Mr. Pontremoli.

Mr. Pontremoli has improved and modernized the Roman irrigation system by adding an above-ground reservoir and a large concrete pool. In addition, he pipes the water that collects in the reservoir into the pool and one of the cisterns. From here the water is pumped through pipes to the crops.

Across one end of a large depression in the land on his farm Mr. Pontremoli has built a concrete wall, which at its highest point is about 8 feet. This reservoir holds the water that drains into it from about 25 acres. A few ditches reach out in different directions to bring as much water as possible into the

Mr. Raymond is Agricultural Attaché, American Embassy, Cairo, Egypt.

reservoir. At the base of the wall near the lowest point in the reservoir, a 10-inch pipe carries the water by gravity into a large concrete pool that has a capacity of 8,000 tons of water. The Roman cistern, which was built below the depression and the surface opening of which is just behind the wall, is filled similarly. A rainfall of only 2 centimeters [1] will fill the reservoir, and even less is required to fill the pool and the cistern. Any excess water flows through pipes directly from the reservoir to the fields.

Mr. Pontremoli's system provides the water necessary to produce vegetables for the five adults in his household and some for his neighbors, many flowers and shrubs, and a supply of fruit, principally peaches the surplus of which is sold at good prices. There is also sufficient water to produce enough native evergreen trees to form a protective windbreak for the gardens and orchards as well as trees for shade.

In addition to the surface water collected in the reservoir from the scanty rainfall (which averages about 8 inches a year), Mr. Pontremoli has a drilled well about 46 feet deep equipped with a 6-horsepower diesel pump. As the well water is brackish, it is used only to a limited extent for irrigation purposes, principally for olives. It is also the source from which a modern swimming pool is regularly supplied. This swimming pool together with the cool shade from the trees and the refreshing breeze of dry, invigorating air that is almost always present makes Mr. Pontremoli's home a highly prized refuge for friends who want to escape from the hot city.

Mr. Pontremoli has a powerful windmill now under construction for which he is using material obtained from scrapped wartime aircraft. When it is completed, it will supplant the power now furnished by the engine to pump water from the well.

Mr. Pontremoli is convinced that beneath the desert wastes in this part of Egypt is an almost inexhaustible supply of underground water. He believes firmly that this part of the desert could be converted into a verdant paradise by artesian wells that could furnish an abundant supply of fresh water to this extremely fertile soil. Some additional capital and technical engineers to locate the wells and plan an irrigation system are the chief requisites to bring forth this change.

I discussed this source of water with Neguib Ibrahim Pasha, Technical Advisor of the Ministry of Public Works of the Egyptian Government. He said that there is an underground body of water running from southern Egypt, west of the Nile River, toward the sea, and it is possible that Mr. Pontremoli's farm could be near the course of this underground stream.

Mr. Pontremoli is a pioneer probing the possibilities of reclaiming vast stretches of almost virgin land that once was covered by forests. It was laid to waste centuries ago by the Bedouins who stripped it of its protection and thus unknowingly exposed it to the death-dealing forces of the wind and semitropical sun.

[1] A centimeter is 0.3937 inch.

This concrete pool is one of the modern features of the ancient irrigation system Mr. Pontremoli is using on his desert farm near Alexandria, Egypt.

World Food Production And Consumption Outlook*

by J. H. RICHTER

Agricultural production in the world at large has increased considerably in the past year, and even in Europe and the Far East improvement has been general and measurable. Yet, despite this increased supply of food and although in important surplus areas there may soon be surpluses of certain commodities, the world food problem is by no means solved. The difficulties that are likely to continue are of a general economic nature rather than due to physical limitations to production on a world-wide scale. Since general economic factors at this time do not seem to favor rapid improvement in nutrition in the world's problem areas, any improvements that may come through the achievements of agricultural and nutritional science are of great importance.

The present statement will, first, discuss direct food supply factors and second, the broader general economic aspects that have a bearing upon the ability of nations to feed themselves. The two cannot, of course, be completely separated since they are to some extent interdependent. Yet they seem to be two distinct logical categories: Specific supply conditions and possibilities; general economic circumstances and probabilities.

Specific Supply Conditions

As to the supply of basic foodstuffs—a term to which some of you may take exception—we know from statistics and observation that the last war has brought extensive declines in production in Europe, the Soviet Union, and Asia. On the other hand, there was a large expansion of production in North America and some expansion in South America and in Oceania. Conditions in Africa, on the whole, showed little change. The world's population has increased by perhaps 10 percent and the per capita supply of the basic food commodities has been reduced drastically. If it is considered that, despite the losses sustained as a result of the war and its consequences, the larger part of the population increase was in areas where food supplies declined, the magnitude of the shortage that had arisen is obvious. The low point in the per capita supplies was reached in 1946 and 1947. Since then improvement has been general and measurable—both in Europe and in Asia. Europe harvested good crops in 1948, and imports under Marshall Plan aid continued large. They were made possible, physically, by large American production and export supplies of grain, an ample world export supply of sugar, and an increase in the world's exportable quantity of fats and oils.

Despite this improvement in the current consumption year 1948–49, and although in important surplus areas unsaleable supplies may soon begin to accumulate, the world food problem is by no means solved. The sharp war-induced increase in the discrepancies in per capita production of basic food commodities as between the sparsely populated surplus countries, which are richly endowed with natural resources, and the densely populated regions with insufficient domestic production is likely to continue—a fact that may have considerable significance for the future of the world's economic, social, and political development.

Continued ample world supplies of grain will be dependent upon continued large crops in America. Exports of wheat from the United States, for example, since the war are at a level of from 10 to 14 million metric tons,[1] or 50 percent of total world exports, while in the 20's they amounted to only 4 million tons, or about 20 percent of total world exports. In the 1930's, exports of wheat from the United States were unimportant. It is true, of course, that European production of grain will continue to increase, but dependence on overseas supplies will remain large since such former exporters as eastern Europe and Russia are unlikely to reach prewar export quantities. At the same time, the European deficit countries' total requirements have substantially risen because of the increase in population. The Far Eastern countries too have import requirements for cereals much larger than before the war. The large concentration of much of the world's exportable grain supply in a small area—the dollar area from which the deficit

*Text of address delivered by Dr. Richter before the meeting of the Food Industries Advisory Committee, The Nutrition Foundation, Inc., at Skytop, Pennsylvania, May 11, 1949.

[1] A short ton equals 0.9072 metric ton.

countries without United States financial aid would find it difficult to buy—makes the grain balance that now exists in the world precarious and labile.

Recent optimistic estimates of present world production of fats and oils indicate a total supply about equal to that of prewar years. Even these estimates, however, imply that per capita supplies are still significantly below prewar. Moreover, world exports from surplus areas are only 70 percent of the prewar level because of the great decline of exports from the Far East (including India) and despite a large increase in exports from North America. The brunt of the shortage falls to such deficit areas as Europe—especially central Europe. The consumption of food fats in Europe, on a per capita basis, is probably no higher than 75 percent of prewar. The shortage of fats and oils, in the opinion of competent experts, is likely to continue for some years, for a number of reasons. First, a substantial increase in exports from the Far East cannot be expected in the near future. Political developments are not conducive to such expansion. Moreover, population there is growing rapidly while at the same time per capita fat consumption, basically very low, is on the increase, partly in view of the insufficient supply of rice. Second, production of animal fats in Europe, which normally account for half of Europe's total fat consumption, is apt to rise only slowly because of the continuing shortage of feedstuffs and general economic factors.

Similarly, the supply of livestock products in general, while ample in America and Oceania, is and will continue considerably below prewar for some time to come in most European countries and in the East, including the Soviet Union. Consumption of meat, eggs, and cheese in Europe is probably not above 75 percent of prewar, in some countries only half of prewar. Fresh milk consumption in Western Europe, because of diversions from other uses of milk, is up to or above prewar level, in other countries still considerably below prewar.

Generally, in appraising the supply level of food in the countries where there are shortages, it must also be remembered that supplies are inequitably distributed so that the shortages in urban centers and among the lower-income groups are greater than the country averages indicate. Even if the Far Eastern problem area is excluded from consideration, it is still true that many millions of people have been short of food for almost a decade and their standard of consumption is likely to remain of qualitatively inferior composition for some time to come.

This prospect is one that does not cogently follow from a consideration of purely physical supply and production possibilities throughout the world. In fact, supplies again begin to outrun effective demand in some areas, such as the United States and Argentina. The present or expected surpluses consist not only of more expensive commodities, such as citrus fruit, dried fruit, eggs, dairy products, or meat, but also of more basic commodities. And it is true in general that the great capacity of some countries to produce surpluses and the possibility of adjusting consumption in some areas of high and wasteful intake could, theoretically, give additional aid in overcoming shortages in other areas. It would be Utopian, however, to assume that this is a realistic or even a reasonable prospect. In the long run, deficit areas can obtain only what they can pay for. This leads to a consideration of general economic circumstances and probabilities—the second and last point to be discussed.

General Economic Factors

The social and economic organization of the world is on national, not international, lines. Hence, the only way in which the world can share its resources and the fruits of its productive efforts is by migration of people from areas of meager resources to areas of more abundant resources, and by trade—in which every nation gives as well as takes, in other words, pays for what it buys.

Migrations, as we all realize, are unlikely to be of great importance in this respect in the foreseeable future, and those forced transfers of population that have taken place as a result of the war have not lessened but intensified the problem of resource distribution in relation to population.

As far as international trade is concerned, we find that, relatively speaking, it is still at a low ebb. The volume of world exports in 1948 has been estimated at something like 90 percent of prewar, or about 80 percent on a per capita basis. Even these figures do not show the extent of the lag of international trade behind a desirable volume that would enable higher all-round living standards.

A considerable share of Europe's imports before the war was covered by income from previous investments abroad. These incomes have largely been lost and have even given way to large-scale indebtedness. At present a considerable share of Europe's imports is financed by grants and loans under Marshall aid, but in the not-distant future Europe will have to pay

Dr. Richter is Head, European Division, Regional Investigations Branch, OFAR.

for all or most of its imports from export proceeds. Moreover, compared with the 1930's, the terms of trade have moved against Europe, meaning that it takes a larger quantity of European export goods to buy a given quantity of European import commodities. For all these reasons, even if there should be little repayment of the financial assistance received from the United States and other overseas countries, Europe requires a much higher export trade than it now has. It is estimated that the increase over prewar in Europe's exports should be of the order of one-third to one-half. Since Europe's exports before the war were roughly one-half of world exports, this means that a desirable volume of world exports should be 20 to 30 percent above prewar, while it now is 10 percent below prewar.

It is difficult to see how this desirable volume of international trade could be attained in the near future. Far-reaching changes in the economic structure of the world impede the flow of international trade. Productivity in Europe and in the Far East has been reduced, in America greatly increased. Industrialization in the countries formerly more preponderantly concerned with primary production has made good progress and tends to narrow the markets of the predominantly industrial countries that are short of primary resources. Political factors and the fear of another war in some countries are not conducive to the reestablishment of conditions that would permit the needed large increase in trade. That, however, means that total production of all goods and services throughout the world cannot be expanded to the extent that it might be if international trade showed greater elasticity. Thus, if an industrial country cannot market abroad enough of such industrial products as it can turn out efficiently, it cannot import as much of needed products, including food and feed, as it should. It is true that the country might intensify its production for the home market and raise, for example, more of the needed food at home, and this is exactly what is in prospect. However, since such production is likely to be high-cost production, *total* production or national income will be lower, and lower incomes do not permit of higher consumption and better nutrition.

Finally, there is another factor that may tend toward holding consumption down. The physical damage caused by the war and its aftermath needs to be repaired. Physical wear and tear of productive capacity that has not been made good over a period of years calls for large-scale replacement, and new investments must be made to bring about needed adjustments in the structure of production. To the extent that resources must be diverted to these investments, they cannot be used in bolstering current consumption. Large-scale armament for military preparedness has a corresponding effect.

Aside from the question of physical limitations to the output of food in quantity and quality, there are, therefore, important general economic limitations to the degree and pace of improvement in general consumption and hence food consumption over the next several years. The argument, in brief, may be summarized as follows: Improvement in food consumption, historically and logically, is part of, and dependent upon, an increase in general living standards. An increase in living standards can only come about through higher all-round production and a fair apportionment of such production to consumptive uses. Production, however, is impeded by the limitations to international trade, a huge expansion of which would be required to permit the nations to produce what they can most efficiently turn out. Furthermore, it is most likely that many countries will have to apportion to consumption a smaller share of their total income or production than they thus apportioned before the war, because of great investment demands and military expenditure. It is, therefore, probable that levels of living in the problem areas of the world will rise only slowly.

This argument, substantially one of theoretical speculation, is supported by actual developments since the end of the war and by the policies and programs that are being put into operation here and there. Thus, Soviet Russia continues its drive toward precipitous rates of industrialization, at the expense of consumption. The iron-curtain countries, in modified fashion, move in the same direction. The Marshall Plan countries in Europe, mindful of the enormous difficulties they face in trying to cut down their trade deficit with the dollar area, have realistically concluded that it cannot alone be done by increasing exports, but must also be attempted by lowering imports and producing directly at home more of the things needed, though at higher relative costs. They also plan to spend substantial resources on investment at home and in developing alternative sources of supply in their colonial or in otherwise related overseas territories—at the sacrifice of a measure of present consumption.

The emphasis in consumption during the next 5 years or so is thus likely to be on austerity, and it is precisely the more responsible type of policy that takes this line. True, there are also sanguine de-

mands for plans to expand consumption rapidly and keep on importing at a high rate—a happy-go-lucky attitude of some deficit countries that appeals to our human instincts and, more importantly, to the business instincts of vested interests. It is clear, however, that such a policy could be made possible only by prolonged and ever-expanding generosity on the part of the United States, which would do no more than postpone the day of reckoning. For, that the most efficient industrial and agricultural producer—the United States—not by natural environment or geographic necessity *forced* to have more than a trickle of import trade, should in the near future be willing and able to expand its imports on a vast and unparalleled scale is altogether improbable. Yet, only such a vast and unparalleled expansion of imports by the United States could bring about the miracle of greatly expanded world trade. It should be noted, however, that, while a "sufficient" increase in American imports over the next several years is improbable, some increase is likely and will contribute to relieving economic imbalance throughout the world. Unfortunately, an increase in American imports does not depend upon the good-will of the American people, but on natural, economic, and institutional circumstances and social propensities, both in the United States and abroad, that are apt to change only slowly.

World Food Outlook

In conclusion, it may be said that the world food outlook for the next 5 years or so is one of modest expectations. That there will be no basic shortages in such areas as the United States, Canada, Argentina, or Australasia goes without saying. In fact, there may be sectional and temporary "surpluses." In the Far East the food supply will at best keep pace with the growth of the population or may even remain below the appalling prewar per capita levels. In Europe, there will no doubt be larger home production and further improvement in consumption and restoration of prewar per capita energy intake, but it is unlikely that consumption will exceed or even reach the modest prewar quality standards.

The presentation of the subject as given in this paper is mainly to emphasize the point that the world food problem cannot be adequately approached from the point of view of food and agriculture alone. It is *a general economic problem* in which political and social factors are of great importance. Yet, this judgment does not in any way imply that research and policies of a technical nature in agriculture and nutrition are of less importance than the fact-finding and policy-making with which the economist is concerned.

On the contrary, just because the general economic factors at this time do not favor rapid improvement in nutrition in the world's problem areas, any improvements that might come through the achievements of agricultural and nutritional science and their application are of very much enhanced importance. And it is one of the more hopeful aspects of the present situation that the agricultural and nutritional sciences have made great progress in the recent past, that their results are better understood by governments and by the people, and that there is hope that they will be translated ever more fully and adequately into policies, practices, and finally habits. Indeed much progress has already been made in this direction as an outgrowth of the combined efforts of nutrition experts, agriculturists, and economists. Greater physical equalization of food supplies as among a country's social groups, practiced through rationing and food subsidies during and after the war; greater awareness of the need for minimum food standards and determination to effect policies that would assure such minima; certain deliberate adjustments in diets; and the adoption of better methods of production and varieties of products are cases in point. Again speaking in economic terms, further progress along these lines as a result of such combined efforts would mean greater efficiency in producing from a given quantity of resources and more rational utilization of what is being produced—all of which adds up to higher production, better distribution, higher standards of living, and at least the possibility of better nutrition.

Sugarcane in Central America

By JULIUS MATZ

Late last year I was asked to consult with and advise the staff members of the cooperatives Centro Nacional de Agronomía of El Salvador and the Instituto Agropecuario Nacional of Guatemala on a disease situation affecting sugarcane in El Salvador and to study problems arising from the introduction of new sugarcane varieties in both countries. This is a brief report on my trip.

Growing sugarcane, and the processing of sugar from it, is one of the largest and most general agricultural activities in each of the Central American countries. Efficient management of the different phases

of the sugar industry, therefore, has a very important place in the general economy of these countries, especially where there is little diversification of crops and industries. Any sizeable improvement in this field would stimulate activity in the other avenues of commerce.

In round numbers, varying somewhat from year to year, the annual production of all types of sugar in Central America ranges from 10,000 tons in Panama to 50,000 tons in Guatemala. San Salvador and Costa Rica each produce 25,000 to 30,000 tons of sugar annually. In each country approximately half the quantity is white centrifuged crystal sugar while the other half is brown "panela" made by evaporating and concentrating the whole cane juice until the sugar crystalizes, with the aid of some agitation, and hardens upon cooling. Ordinarily the production in each country is sufficient for home consumption, with a small surplus or shortage during some years.

The highest yields at the few larger plantations and at the higher elevations are around 200 pounds of sugar per ton of cane. These yields are about 40 pounds per ton short of those obtained in Cuba, Santo Domingo, Puerto Rico, and other West Indies areas. But yields around 150 pounds and less are the more common in Central America in the larger number of small plantations and particularly in the lowlands.

In spite of relatively low labor costs and guaranteed home markets, the consumers in Central America pay more for their domestically produced inferior grades of sugar than did the people of the United States, until recently, for their largely extra-continental and imported sugar. Perhaps the chief reason for the high cost of the product and the small return to labor is the low yield of sugar. It takes almost 2 tons of cane to yield 250 pounds of sugar in the smaller lowland sugar factories where most of Central America's sugar is processed, while in the West Indies only 1 ton of cane may produce this quantity of sugar or more.

With the application of existing knowledge to field and factory management, the inequalities in yields and costs, as they exist today in the Caribbean region, would level off, and a freer movement of sugar from excess producers would become normal and unhampered.

Generally when crop yields are low, insects and diseases are influential factors. In Central American sugar fields, however, they are relatively unimportant. The major diseases—downy mildew, smut, fiji, gummosis, and streak—have not been reported in

Sugarcane experimental planting in Guatemala. The mosaic-resistant POJ 2878 is shown at the right.

Central America. Root rots and leaf spots are not evident in epidemic form. The virus disease, mosaic, has become scarce and is to be found in limited areas where the disease and mosaic-susceptible varieties are tolerated. The bacterial gummosis disease, which invaded some of the West Indies from Puerto Rico eastward to Barbados in the 1920's, has been arrested and eliminated from sugarcane through the spread of the variety BH 10/12 in the localities where it was adaptable and where gummosis made its strongest attack. This disease probably never reached Central America.

The endemic Frog Hopper Blight is the only real threat to Central American sugarcane. This disease is caused by the spittle-bug, or frog hopper, *Tomaspis saccharina* and related species, which appear sporadically from Mexico to Venezuela. In Trinidad, the hopper has been an established major cane pest for some time. The effects of the blight vary with the species of insects concerned in the attack—and there are a considerable variety of them—and with the conditions under which the sugarcane grows.

I observed these insects, and their effects on sugarcane and grasses, in cane fields in Mexico and Guatemala in 1946, on Napiergrass in Costa Rica in 1945, on Guinea grass in Panama in 1942, and more recently on sugarcane in San Salvador.

The adult hoppers puncture the leaves and suck their juices, causing yellow tapering stripes that become dry. In severe attacks this reduces the vital leaf surface to such an extent that indirectly it interferes with normal root development and replacement, thus reducing the food and moisture supply to the plant.

This small sugar factory in Panama can turn out 800 tons of sugar a season.

Therefore, in wet heavy soils, where root development is naturally slow, the leaves, in addition to the yellow streaks, because of paucity of roots, wilt and dry from their tips and margins inward, often causing the drying up of the entire top. There is also the added burden on the roots of supporting the larvae of this insect. Under the right soil conditions, the atrophied cane roots, caused by the insect-induced defects in the leaves, will be replaced by new growth.

Because the damage the hoppers do to the plants is not apparent until some time after the hoppers leave, crop failures are occasionally credited to other causes. For example, the severe effects I observed in the sugarcane in El Salvador appeared some time after the insect colonies had died or moved to their natural haunts in the neighboring woods.

With the development of such new insecticides as DDT, it should be possible to control hopper outbreaks if the correct diagnosis is made in time.

I stated above that mosaic is becoming scarce in the cane fields of Central America. This is largely the result of the general adoption of the very resistant POJ 2878 variety. With the continued attempts to produce improved seedlings, POJ 2878 may give way to canes that are higher in sucrose but less resistant to mosaic. It is important that these new seedlings be watched for mosaic even when varieties show only an occasional infected plant. For example, B 3439 and M 28 are both highly resistant to mosaic and are less prone to flower and maintain their uniform girth. If they should replace POJ 2878, it would be essential that all traces of mosaic be eliminated from the present plant material sources from which the new introduction will be propagated.

Proper planting methods are also important to the success of new sugarcane varieties and their early trials. They should be allowed wider spacing to permit close observation and to avoid crowding, to detect infirmities, and to allow for different growth habits. The massing of varieties without regard for their distinctive habits of growth often, through imposed competition, suppresses a variety that by itself would develop outstandingly. Indiscriminate planting of mosaic-susceptible varieties in areas in which mosaic is established would eliminate from further propagation valuable varieties, which might otherwise be saved and extended after mosaic is eliminated.

Rehabilitation of the cane fields of Central America with varieties that have proved successful in other regions may increase the bulk of crop, provided the new introductions are adaptable. And revising the methods of soil and crop management will pay the grower dividends both in lower production costs and in higher sugar yields.

Dr. Matz is Pathologist, Bureau of Plant Industry, Soils, and Agricultural Engineering, ARA. He is now on detail to Technical Collaboration Branch, OFAR.

Reading about... Foreign Agriculture

Future Food and Agriculture Policy—A Program for the Next Ten Years, by John D. Black and Maxine E. Kiefer, 348 pp., illus. McGraw-Hill Book Co. Inc., New York, 1948. This volume offers a rather thorough analysis of the food and agricultural problems that face the world in the next decade. John D. Black, of Harvard University, and Maxine Kiefer, of the United Nations Food and Agriculture staff, offer a sound and intelligent appraisal of a vital topic. The text reviews and evaluates the food and agricultural programs now in operation in a number of countries, with particular reference to the United States, suggests revised programs to be adopted for solving shortages and spreading the food supply, and gives constructive outlines for action to be taken by various groups in execution of these revised programs. The book undertakes to bring the well-being of farming folk and the better nutrition of mankind into harmony and outlines methods and procedures calculated to help achieve that objective. The authors offer the solution for the world's age-old problem of gearing production and consumption closer together.

Cooperative Customers Abroad

by JOHN H. HECKMAN

European cooperatives are potential customers for a large volume of products from the United States. Postwar trade problems are retarding this market today.

Consumer and agricultural cooperatives make up a substantial block of potential customers in the 10 countries that I visited last winter—England, Scotland, Norway, Sweden, Denmark, Holland, Belgium, France, Switzerland, and Italy. Both types of cooperatives bought extensively from the United States before the war, the consumer cooperatives being the biggest buyers. They often prefer the products of the United States to those of other countries and look forward to the relaxing of trade restrictions.

The term, "potential customer," had best be used in this discussion because at the present time trading is greatly restricted in these countries. In most of them the government, in its effort to rehabilitate the country's economy, either directly handles the buying of foreign products or supervises the buying through import committees, allocations, and licenses. In most cases the cooperative merely receives its share of the national pool and has no control over the source or procurement.

A relaxation of restrictions would permit the purchase of many popular items that are now considered luxuries and are not imported at all.

The plans of these cooperatives, in general, envisage more direct dealing with individual shippers or packers and less dealing through agents. They hope to expand and strengthen both national and international cooperative agencies.

To aid these plans, European cooperatives have studied the procurement and distribution systems of the large chain stores in the United States. As a result, their programs are being planned along the general lines followed by these organizations.

Cooperatives, like other buyers, however, must fit into the trade pattern of the country. Just now, this pattern is controlled in large part by the foreign-exchange balance between the various countries. And the supply of United States dollars in most of Europe is small. This generally rigid currency situation is sending many of these nations into bilateral trade and barter agreements, with preference going to nondollar areas.

Also the people of these European countries remember the hunger of the war and postwar years. To stave off a possible recurrence of this situation, they have embarked on programs of planned increases over prewar production of such commodities as fruit, grains, and dairy and poultry products. These programs, combined with the channeling of trade to nondollar areas, are setting a trend that might cut United States imports considerably.

Economic recovery would tend to arrest this trend. Convertible currency would permit the United States to trade in some of those countries having the same major surpluses that it has. These common surpluses prevent direct exchanges for needed commodities. Thus the sooner economic stability is attained, the less permanent will be the effects of this trend and the sooner the United States can expect a greater share in the long-term markets of these nations.

Within the limits of government policy and trade restrictions, these cooperative organizations are substantial factors in business. In most of the 10 countries the cooperatives are the largest individual buying units. In volume as well as procurement methods, consumer cooperatives are the counterpart of chain stores in the United States. Food distribution, however, still revolves around the family-operated store. In the case of other goods, large general stores are common, but the chain store has not been popular.

The proportion of total goods that cooperatives handle in a country varies. In all of them except Italy, however, the proportion is at least 5 percent and ranges up to 35 percent. For some individual items the proportion is much higher. For instance, in Scotland the cooperative wholesale society sells about 40 percent of such rationed goods as sugar, butter, margarine, lard, and cheese. Sweden's cooperative society controls all vegetable-oil milling facilities in the country. Thus, all vegetable-oil seeds are handled by the cooperatives. In France the farm-supply cooperative sells about half of the imported feedstuffs.

Mr. Heckman is Agricultural Economist, Farm Credit Administration. On loan to OFAR and working under the provisions of the Research and Marketing Act, he spent about 2½ months in Europe making a study of cooperatives as possible outlets for United States products.

The attitude of these cooperatives toward United States products varies with the policies of American exporting firms. United States exporters, both cooperative and private, have followed two policies in their use of European markets.

One has been to develop the market and to cultivate buyer preference and confidence. Advertising and constant study have keyed products to the needs of the individual market. This policy has paid dividends to American exporters. Cooperative buyers have described these products as better graded and packed and generally more marketable than those from any other country. This dependability has often led to a preference for the United States product, although the natural flavor of the same product from another country may be preferred.

On the other hand, some American firms have used European markets as a dumping ground for surpluses. For example, I noticed in one market that the cooperative wholesaler, when offering a particular United States product for sale, acknowledged the inferior quality of the product by labeling it only "imported." Similar products from competing countries carried the label of the country of its origin.

Trade-wise United States businessmen will realize that the decision they make on their foreign trade policies is of basic importance to future business.

Comprised of industrial workers, who are not luxury buyers, the consumer groups are largely in the market for staple goods and raw products for the manufacture of staple items. Grain and dried fruits are leaders in this list.

A number of the cooperatives pointed out the possibility of barter or exchange of goods between their organizations and shippers in the United States. Quite a variety of items was mentioned as available for exchange in these countries, among them fish meal, prefabricated houses, skis, cheese, and wine.

U. S. Commodities Preferred

Following is a summary of opinions frequently expressed by the cooperatives' buyers regarding commodities they had purchased or wished to purchase in the United States.

Dried fruits.—These are chiefly raisins and prunes, described by most cooperatives as better graded, more sanitary, and of more dependable quality than those from any other country. The prunes are reported superior in every way. Even though the color and flavor of raisins from other countries are

Wholesale cooperative, Stockholm, Sweden. 1948.

Rochdale Pioneers Society, England, opened its first store in this building in 1844.

considered superior, the market dependability of United States raisins makes them the choice in practically all these countries.

Deciduous fruits.—Fresh fruits most commonly bought are apples, pears, and Emperor grapes. The canned fruits—called salad fruits in Europe—are mostly peaches, pears, and fruit salad or fruit cocktail. All these products are excellent in quality but too expensive to be generally used in large quantities by industrial workers.

Citrus.—The most popular citrus and citrus products are California oranges, Texas grapefruit, and Florida juices. Although most Europeans have never acquired the grapefruit and juice habit, these products compare favorably in the small market available, with citrus fruits from other countries.

Rice.—The Blue Rose type is by far the most popular rice secured from the United States. As some of the cooperatives have mills, rough rice is purchased for milling. Those without mills buy the prepared product.

Frozen eggs.—Frozen eggs are largely used in the cooperative bakeries. They would like to get more of their supplies from the United States since its product is good and former sources are uncertain.

Soybean and cottonseed oils.—Soybean and cottonseed oils supply margarine factories run by wholesale societies. Margarine fits the pocketbooks of the medium-income industrial workers, and with vegetable oils scarce in Europe and delivery doubtful from Oriental sources, cooperatives are looking to the United States for part of their future supplies.

Inedible animal fats.—These fats are scarce and expensive in Europe, and since all of the central cooperatives have soap factories, they are interested in getting cheap, inedible fats from the United States.

Soybean and cottonseed meal.—The farm-supply cooperatives need soybean and cottonseed meals for feed mixtures.

Grain sorghums.—Grain sorghum seeds are becoming increasingly popular as ingredients of poultry-feed mixtures. As poultry production is rapidly increasing in most of these countries, the farm-supply cooperatives expect increased demand for these grains.

Oilseeds.—A number of cooperatives, both consumer and agricultural, have oil mills. As a smaller supply of oilseeds is expected to be available from the Orient in the future, the cooperatives think increased supplies will be needed from the United States. The consumer cooperatives mill the seeds for oil for making margarine and then sell the meal. The agricultural cooperatives mill the seeds to get the meal and then sell the oil.

Wheat.—Wheat was frequently mentioned as an item desired from the United States. The procurement of wheat, however, will likely be handled by

government in most of these countries for some time to come. Government control of wheat and bread grains began in some of these countries as early as 1925 and will probably continue well into the post-war period.

Organization of Cooperatives

The foundation of the cooperative set-up in each country is the local society. In the consumer societies, these units are general-purpose retail stores. In the farm-supply cooperatives the local unit is usually a warehouse for supplies. Food is the leading product in the consumer stores, but they sell many additional items. In fact, many local-society shops resemble department stores.

The number of stores operated by the consumer societies varies from 1 to more than 1,000. In these countries, the proportion of food stores that are cooperative varies from a few percent to about one-third. This high percentage is in Sweden.

Generally the local societies are organized into district federations. These in turn are federated into central cooperative wholesale societies. In all countries except Italy and Belgium a central cooperative wholesale society is the source of distant supplies for the local societies. In most instances the individual societies handle their own local buying.

For the most part, cooperatives in Europe were developed to meet the needs of the industrial workers during the latter part of the past century and the first part of the present one. Partly as the result of an urge for assurance of supply and partly because of boycotts by private companies, cooperatives try to fill the "cradle to the grave" span with a complete set of goods and services. Thus, instead of cooperative activities in Europe being "programs" as they are in the United States they are "movements" and are cited as such.

Also stemming from the urge for economy and security of source of supply, these wholesale societies have a general purchasing policy: First choice, "make it or produce it"; second choice, "buy it at home as near the production source as possible"; third choice, "buy it abroad as near the production source as possible."

With this policy in mind, the cooperatives are operating factories that produce an amazing array of products. They include furniture, radios, light bulbs, shoes, clothing, coffee, tobacco, canned goods, margarine, and soap. Oil refineries, flour mills, and bakeries are also maintained by the societies.

The number of factories and the total percentage of manufactured items used are increasing. Some of the societies have also expanded into agricultural production.

In addition to serving as wholesale suppliers, the central societies sponsor a wide variety of services. Among these are banking, insurance, housing, dental care, optometry, hair dressing, laundry service, movies, youth programs—comparable to Boy Scouts and Girl Scouts—colleges, libraries, study groups, and rest camps. The small societies have fewer services but maintain as many as possible because the general objective is the same. This goal, if completely carried out, tends to separate the cooperative groups into separate segments of society.

Outlook

Today the bottleneck caused by dollar shortages and governmental limitations permits only small allocations of United States commodities to squeeze through to cooperative purchasers abroad. In some cases, complete embargoes exist. But when trading does resume, the cooperatives will be among the largest buying units in Europe. Built by industrial workers to supply their needs, these wholesale groups are geared to buy staple items in large quantities. Their renewed activity should broaden the scope of United States trade across the Atlantic.

Okinawa's Agriculture In the Wake of War

By JOHN C. HOBBES

Okinawa, a small, densely populated island southwest of Japan, was the stage of one of the most savage battles of World War II. As a result, its population was displaced, its economy disrupted, and the area of cultivated land reduced. Before the war, the Okinawans could not produce enough food to meet their needs, but they exported sugar to Japan to pay for the necessary imports. Today there is no market for Okinawa's sugar, and American taxpayers must pay for a large part of the native diet until Military Government can rehabilitate the island's agriculture.

Okinawa is unique among the islands of Japan, having a different type of people, a different pattern of agriculture, and being the only one on which actual combat took place during World War II. As a result of the havoc wrought by the occupation in the spring of 1945, its economy and social fabric were almost completely destroyed, and the island's ability to provide its food requirements was greatly reduced. Okinawa, along with other islands of the Ryukyus,

Native women make their way home after working in the fields, baskets of food atop their heads. Cheap agricultural labor is Okinawa's greatest resource.

has been severed from the Japanese Imperial Government and added to the chain of American defenses in the Pacific. Under the aegis of Military Government, efforts are under way to restore to the natives some semblance of economic solvency. Since power and mineral resources are almost totally lacking, "economic problems" are "agricultural problems." The island's principal asset is an abundant supply of agricultural labor. The population is excessive, the soil is poor, and, as a result, Military Government is faced with an urgent and delicate problem of agricultural rehabilitation.

Okinawa is a small, subtropical island lying midway between Japan and Formosa and had been an integral part of Nippon proper since 1879. It is from 2 to 16 miles wide and 67 miles long, and, before the war, contained 92,000 acres of farm land, about 1 percent of the cultivated land of Japan. This small area supported a prewar population of 436,000.

Okinawa and its surrounding islands might well be referred to as Japan's "nonconforming prefecture" in that its people stood apart from the Japanese, and some interesting contrasts to Japanese agriculture were to be found. For one thing, agriculture was the most important industry of the island. Almost three-fourths of the gainfully employed in Okinawa made their living in farming, whereas less than one-half were so employed in Japan.

Further contrast may be found in patterns of Okinawan agriculture. On Okinawa, sweetpotatoes attained the importance as a food crop that is usually accorded to rice in Japan and other areas of the Far East. About 50 percent of the land was devoted to the raising of sweetpotatoes—a portion larger than that devoted to rice in Japan.

Okinawa's system of land tenure differed from the other prefectures in two ways, most outstanding of which was its extremely low rate of tenancy. Prior to the occupation, only 15 percent of the land on Okinawa was tilled by tenants, as compared with 46 percent in Japan. More than 60 percent of the farm operators owned more than nine-tenths of the land they tilled. This apparently favorable condition sprang out of a communal system of land tenure extant in the Ryukyus prior to the turn of the century. Widespread land ownership by Okinawan farmers was offset by the extremely small size of the holdings. Okinawan farms, averaging about 1½ acres, were slightly more than half as large as those tilled by Japanese farmers, which explains the poverty of the natives.

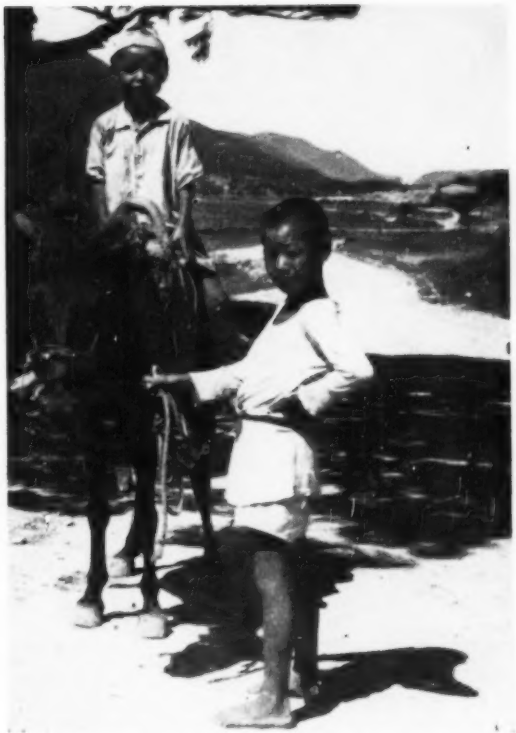
A third aspect in which agriculture on Okinawa varied from the Japanese norm was found in its livestock population. In both the ratio of animals to cultivated land and to population, Okinawa was the more favorably situated. This small island had relatively more draft animals than the rest of Japan, and more than one-third of the goats in Japan were to be found on Okinawa. The small sure-footed native horse predominated among draft animals. The native cattle are suitable only for draft power and meat and few had ever been used for dairy purposes. Swine and goats played a strategic role in the tightly knit subsistence economy of the island by providing an economical means of disposing of garbage and waste. In addition to augmenting the native diet and supplying draft power, the large animal population afforded the farmers relatively greater quantities of manure.

In the prewar years the natives produced only two major crops in quantities sufficient or surplus to their needs. These were sweetpotatoes and sugarcane.

Because of the islanders' relatively low standard of living, sweetpotatoes were relied upon to supply the bulk of the calories consumed. Although sweetpotatoes are ordinarily an undesirable item of diet and are deficient in protein, they are more efficient in the production of calories per unit area than is rice. Another advantage favorable to the widespread production of sweetpotatoes is that they grow the year around and may be propagated by slips cut from the growing vine, thus obviating the need for a seed reserve. Furthermore, sweetpotatoes, a root crop, are not greatly affected by the typhoons that frequently visit the island.

Before the invasion, sugarcane occupied one-fourth of the cultivated land and constituted the island's only important industrial crop. During the 1930's, sugar alone accounted for about 60 percent of the exports of the Okinawan Prefecture and enabled imports of additional food and other necessities. Had it not been for a subsidy provided by the Japanese Government, sugar would never have attained much importance in the island's economy, since natural conditions alone do not warrant its production. Production and processing methods were primitive in contrast to those found in other sugar-producing areas of the world. The resultant yields of sugar were low. Now that the island is under a separate government, there is neither a market nor a subsidy for Okinawa's sugar, and the land formerly occupied by this crop is planted to vegetables. The loss of this industry leaves a gap in the island's economy that may be filled either by planting that land to food crops in an attempt at self-sufficiency or by devoting it to the production of some other export crop.

In all other crops, Okinawa was deficient. Its farmers could produce only one-third of the rice needs and about three-fourths of the soybeans and the minor grains, such as barley, millets, and wheat. Farming methods were primitive. Most of the work was done by hand and with crude tools, and the yields of these crops were generally lower than those of Japan. Although commercial fertilizers were imported in substantial quantities and were augmented by abundant quantities of animal manure, it has been computed that the productivity of the tiny Okinawan fields was only about 74 percent of those of Japan. With the assistance now being given, it is possible that farm practices may be improved. The pattern of agriculture and the population situation are such, however, that there is little hope of raising Okinawa's agricultural production to the point where food imports are unnecessary.



Small native horses are the most prevalent beasts of burden on Okinawa.

Even before the island was invaded in April 1945, it felt the effects of the war. In the preceding few years the cultivated area had contracted slightly and animal population declined because of a lack of feed. The battle for the island centered in the populous agricultural area in the south. More than 90 percent of the buildings and equipment were destroyed, and most of the people were displaced from their homes and from the food-producing areas. The armed forces found the livestock scattered and undernourished, and, lacking sufficient food for both the animals and the natives, they were forced to kill the former to feed the latter. To add to the food problem created by moving the farmers from the land, repatriates began to pour in from the mandated islands, and in a short time the population exceeded that of the preceding decade. In anticipation of an assault on the main islands of Japan, military establishments

Mr. Hobbes is Regional Specialist, OFAR.

mushroomed over much of the cultivated area on the island. The normal facilities for governing and feeding the natives were destroyed completely by the occupation, presenting Military Government with an immense task involving the health and livelihood of half a million people.

For more than 4 years, the Okinawans have had to rely upon the United States for a substantial portion of their diet. The problem of agricultural rehabilitation has been one of reconciling the military needs for land and civilian food requirements, the latter having increased abnormally due to the influx of repatriates. Heavy earth-moving equipment leveled some of the hilly, sparsely settled northern region in an effort to reclaim land for farming so as to compensate for the areas of farm land necessarily occupied by military establishments and to expand the area available to native farmers. The equipment destroyed in battle has been replaced by imports or by native craftsmen using metal salvaged from war surplus and battlefield debris. Military Government has also provided fertilizers and supplies that otherwise would not be available to the Okinawans and without which they would be helpless. In the rehabilitation of the rural community, a large problem centers around the depleted livestock population that declined to a small fraction of prewar. There is an urgent need for the manure and draft power that they supplied, and years will pass before a balance is attained between the increased food production made possible by the animal population and the amount of feed they themselves consume. To date, the livestock population has been replenished largely by imports from other islands less affected by the war and by natural reproduction.

The only Japanese island to suffer direct invasion, Okinawa lost 90 percent of its buildings and equipment.

Military Government is actively improving social and economic conditions on Okinawa by reestablishing and improving on prewar institutions and by furnishing on a welfare basis the necessary food, equipment, and supplies.

Provision has been made for economic aid to the native farmers through the Okinawan Central Agricultural Association, which was created in 1946. This organization is manned by natives and manages all the services with which the farmers have direct contact. It handles all matters of transportation, distribution of supplies, marketing, extension, loans to local credit associations, and other services that were only slightly coordinated in prewar years. Seed farms, experiment stations, vocational agricultural schools, stock-breeding programs, and other plans have been initiated by Military Government in order to alleviate the food situation through improving the seed, livestock, and skill of the native farmer. Despite the efforts of military and native personnel, the current agricultural situation is far from favorable. Only in the case of vegetables and sweetpotatoes are yields equal to those of former years, and total production of all foods is still below normal.

Military authorities anticipate that the best use of the maximum area of cultivable land made available to the natives will necessitate food imports only slightly less than those currently required. It is improbable that the small amount of farm land available will ever produce enough food for the islanders. Two alternatives, or a combination of them, might be adopted to make the natives self-sufficient to a greater degree. One would be to plant the land formerly producing sugarcane—one-fourth of Okinawa's arable area—to food crops. The other would be to concentrate on the production of some new export crop, which would utilize the abundant manpower available, and to buy abroad the balance of the food requirements with the income so derived as was done before the war. Greater production under any program is the object of the Military Government. Because of the more pressing military problems, it has not been possible to work out completely the postwar pattern of agriculture for Okinawa. Until a satisfactory agricultural economy is established, the island and its people will continue to be a burden to the American taxpayer.

INTERNATIONAL
Agricultural News

International Cotton Advisory Committee Meets at Brussels

The International Cotton Advisory Committee met in Brussels for its eighth plenary meeting April 25–30. Delegations of 18 member governments attended, and 12 other governments were represented by observers. The Committee is an international consultative body established in 1939 to keep the world position of cotton under review and to recommend to member governments desirable lines of international collaboration. A standing committee meets at monthly intervals, and a permanent secretariat is maintained in Washington.

At the April meeting, the delegates examined the world cotton situation in detail and exchanged formal statements on their national policies and on conditions in their respective countries.

Noting the rapid recovery of world cotton production and the reappearance of prewar tendencies of stocks to accumulate concurrently with widespread underconsumption of cotton products, the Committee directed that a special study be made of factors affecting cotton consumption with a view to submitting suggestions for alleviating such difficulties. The delegates recognized that the developing world cotton situation required continuous review by the standing committee and that preparation should be made for further collaboration between governments.

Member governments represented were: Australia, Austria, Belgium, Canada, Czechoslovakia, Egypt, France, Greece, India, Italy, Lebanon, Mexico, the Netherlands, Pakistan, Peru, Turkey, the United Kingdom, and the United States. Observers were sent by Bolivia, Chile, the Dominican Republic, Finland, Nicaragua, Poland, Portugal, Siam, Sweden, Switzerland, Syria, and Yugoslavia, as well as by the International Federation of Agricultural Producers and the International Federation of Master Cotton Spinners.

The Brussels meeting was formally opened by M. Moens de Fernig, Belgian Minister of Foreign Trade. M. Albert Moulaert, Minister Plenipotentiary of Belgium, presided.

An Attaché Tours Europe

Eric Englund, United States Agricultural Attaché to Sweden and Finland, recently took a postman's holiday and toured Europe by automobile. He found farm and crop conditions along his route generally good, with production at the highest point since the war. There was little evidence of malnutrition among the people he saw, and reconstruction seemed to be improving.

Driving across Denmark from Frederikshavn to the German border, he and his wife saw fall-sown grain up to an excellent stand on most fields, spring grain was already high, and the general appearance of the countryside was one of careful workmanship and order. Fields appeared of size, shape, and contour suited to tractor work, but the newly cultivated fields showed hoof prints rather than tractor wheels.

Across the German border, Dr. Englund noted that the fields were not on the whole in as good condition as those he had seen in Denmark. In the Hamburg area, conditions were much improved over a year ago, with numerous buildings and homes under construction.

In Bremen, where pear and plum trees were in bloom, children played among the ruins. They seemed cheerful and healthy, without obvious signs of malnutrition. Their clothing was surprisingly good and their shoes adequate. Dr. Englund remarked that the clothing situation in Germany, as typified by these children in Bremen, was much better than he had expected. Housing still remains the most pressing problem to Germans in urban areas.

Up the Rhine from Cologne, well-tended orchards of fruit trees gradually gave way to the vineyards along the hillsides in this section long famous for its castles. A unique irrigation system of very narrow contour ditches was in use in the Black Forest region.

Only in the Karlsruhe section did the Attaché find malnutrition among the children. In general the German people were well clothed and adequately fed. Spring crops had been started and, despite primitive farming methods, the countryside appeared prosperous and productive.

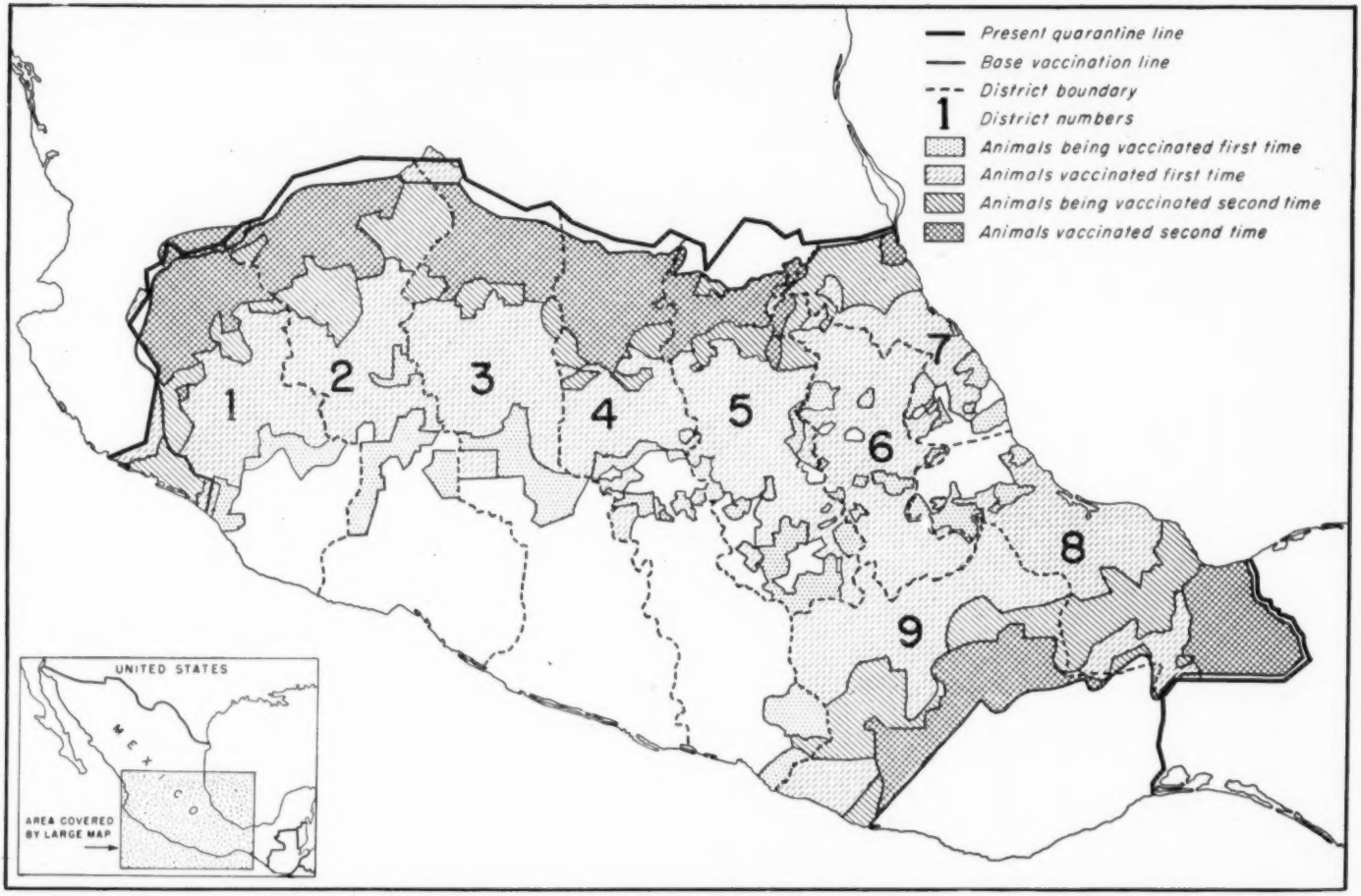
Unseasonably warm weather in Switzerland had dried the land, and soil temperature was no doubt higher than usual. Streams were low even during the spring thaw. Apple trees in the roadside orchards were very old, large, and unpruned. Most of these dying orchards were standing unused, yielding fair grass for pasture but not for quality hay.

This rural picture changed as the Englunds drove from Bern to Geneva. Here potatoes were being planted, gardens were green and full, milk cows were in good condition, and grain waved in the fields. The Swiss people are living well in their Alpine world.

In Italy, near La Spezia, the beauty of the mountains, rising above the sea, contrasted with the visible signs of destruction left by war. Except for vineyards, small gardens, and fruit trees, there was little agriculture in the section. Recent rains had moistened the soil, but the streams were still low.

As they neared Rome, the land became dry, and the crops poor. The road led through badly eroded hills, and a brief rain sent thick, muddy trickles down to the streams below. This erosion has been brought on by an age-old pattern of farming. Hillside plowing and overgrazing by sheep through the centuries have destroyed the grass and torn the fertile topsoil from the land.

On his way back to Stockholm, Dr. Englund attended agricultural conferences in Paris.



The foot-and-mouth disease situation in Mexico, May 20, 1949. The quarantine area, roughly the size of Texas, contains some 15 million animals susceptible to foot-and-mouth disease. These animals must be vaccinated at 4-month intervals. More than three-fourths of them have had their first vaccination.

U. S. GOVERNMENT PRINTING OFFICE: 1949